

CHAPTER 108 EVALUATE FAR PART 125 EMERGENCY EVACUATION/DITCHING DEMONSTRATION/PROCEDURES

Section 1 Background

1. PTRS ACTIVITY CODES

A. *Maintenance*: 3308

B. *Avionics*: 5308

C. *Cabin Safety*: Pending

3. OBJECTIVE. This chapter provides guidance for conducting FAR Part 125 emergency evacuation and ditching demonstrations.

5. GENERAL

A. Definitions

(1) *Dark of Night*. A level of illumination approximating the natural level of light that occurs 90 minutes after official sunset under clear sky conditions.

(2) *Demonstration Project Coordinator*. The individual assigned by the operator/applicant to organize and conduct the demonstration. This person also serves as official contact with the FAA for the purposes of the demonstration.

(3) *Ditching Demonstration*. The evacuation of passengers and crew into life rafts after a simulated forced water landing.

(4) *Emergency Evacuation Demonstration*. The evacuation of passengers and crew from a simulated aborted takeoff.

(5) *Extended Over-Water Operations*. Flights conducted at a horizontal distance of more than 50 nautical miles from the nearest shoreline.

(6) *FAA Team Leader*. The Aviation Safety Inspector (ASI) who heads the FAA team evaluating the

emergency evacuation or ditching demonstration. In the case of an existing operator, it is the Principal Operations Inspector; for a FAR Part 125 certificate applicant, it is the Certification Project Manager.

(7) *Launch a Life Raft*. Remove the life raft from storage, manipulate it out of the airplane via stands and ramps, and position it on the ground before inflation.

(8) *Launch a Slide Raft*. Inflate the slide raft in a normal manner, then lower it to the ground.

(9) *Passengers*. Participants in the demonstrations who represent aircraft passengers. These individuals may not be crewmembers, mechanics, or training personnel.

(10) *Seating Configuration*. The number of passenger seats authorized for use by the manufacturer type certificate or production data, supplemental type certificate, or other FAA-approved data. Adding or removing seats is a major alteration and requires appropriate FAA approval.

B. Type Certification Demonstrations. An airplane manufacturer must conduct an emergency evacuation demonstration in accordance with FAR § 25.803 to obtain type-certification. This demonstration is the responsibility of the applicable FAA Aircraft Certification Office (ACO) and tests the following:

- The basic airplane design and its ability to be evacuated safely
- The airplane's emergency evacuation systems
- The manufacturer's FAA-approved emergency evacuation procedures

7. REGULATORY REQUIREMENTS. FAR §§ 25.803 and 125.189 and FAR Part 125, Appendix B, specify the requirements for conducting these demonstrations, when they

must be performed, how they are to be conducted, and the specific criteria which must be met by the applicant, operator, or manufacturer.

A. *FAR Part 125 Demonstrations.* FAR Part 125 specifies two types of evacuation demonstrations: a full-scale aborted takeoff and a full-scale ditching.

B. *Partial Demonstrations.* Partial aborted takeoff or partial ditching demonstrations are not allowed under FAR Part 125 except by deviation authority. Procedures would be the same as for the full-scale aborted takeoff or full-scale ditching. Criteria that can be used for evaluation are FAR § 121.291(c)(1) and (e) and the Air Transportation Operations Inspector's Handbook.

C. *Initial Introduction of a Type and Model Aircraft.*

FAR § 125.189(a)(1) requires an emergency evacuation demonstration upon initial introduction of a type and model airplane for carrying passengers. If the operator has previously conducted a successful demonstration of an airplane of the same type or model, with the same number and type of exits, the same cabin configuration, and the same emergency equipment, the demonstration does not have to be repeated.

D. *Increase in Seating Capacity.* FAR § 125.189(a)(2) requires an operator to conduct a full-scale emergency evacuation demonstration when the following changes occur:

- Passenger seating capacity is increased by more than 5 percent over that successfully demonstrated
- A major change in the passenger cabin interior configuration affects the emergency evacuation of passengers

E. *Full-Scale Demonstrations.* A full-scale emergency evacuation demonstration simulates an aborted takeoff. It requires each passenger seat installed on the airplane to be occupied by a demonstration participant before initiation of the demonstration.

- (1) After the initiation signal, all participants and

crewmembers must be evacuated using the airplane's emergency evacuation equipment and no more than 50 percent of the emergency exits and slides.

- (2) The demonstration must show that the airplane and emergency equipment, using operator-developed emergency procedures, allow for the evacuation of the airplane's full seating capacity, including crewmembers, in 90 seconds or less.

- (3) An operator proposing to use a type and model airplane with a seating capacity greater than has ever been previously demonstrated for that particular type and model must conduct a full-scale demonstration with that type and model of airplane.

- (4) FAR Part 125, Appendix B, outlines specific conditions and criteria used during full-scale emergency evacuation demonstrations. The appendix is divided into two sections.

- Section (a), the aborted takeoff demonstration, specifies the requirements for a full-scale evacuation demonstration, including such items as environmental conditions, passenger complement, crewmember qualifications, and the number of exits to be opened.
- Section (b), the ditching demonstration, specifies the requirements for a simulated ditching, including testing crewmember knowledge of emergency equipment, procedures, and emergency equipment reliability.

F. *Extended Overwater Operations.* FAR § 125.189(c) requires an applicant/operator intending to engage in extended overwater operations (defined in FAR § 1.1) to conduct a full-scale, simulated ditching demonstration in accordance with FAR Part 125, Appendix B. If the certificate holder has previously conducted a successful simulated ditching as required by FAR § 121.291(d) in the same type airplane, an additional ditching demonstration is not required.

G. *Analysis and Tests.* FAR § 25.803(d) permits the use of a combination of analyses and tests to show that an airplane

is capable of being evacuated within 90 seconds under the conditions specified in FAR § 25.803(c). Analysis and tests can be used only if the Administrator finds that this method will provide emergency evacuation demonstration data equivalent to an actual demonstration.

(1) The FAA, however, prohibits the use of analysis and tests to increase seating capacity more than 5 percent above the seating capacity established by a full-scale demonstration. For example, if a full-scale demonstration was satisfactorily accomplished with a maximum seating capacity of 200 passengers, the analysis and test method would allow up to a maximum of 10 additional passengers. No further increase in capacity above the 210-passenger limit would be permitted without a full-scale demonstration.

(2) This 5 percent increase may not be approved by the certification team or the POI without the analyses and tests being evaluated by the appropriate Aircraft Certification Office. Any request for an increase of up to 5 percent by the analysis and test method shall be forwarded through AFS-1 to the appropriate Aircraft Certification Office. The Aircraft Certification Office is the organization within the FAA authorized to evaluate the analysis and tests.

9. MANUFACTURER CONDUCTED DEMONSTRATIONS. FAR § 25.803(c) requires manufacturers of transport category airplanes having more than 44 passenger seats to conduct a full-scale demonstration for the issuance of a type certificate. If the manufacturer wants the demonstration to meet both the certification requirements of FAR § 25.803(c) and the operational requirements of FAR § 125.189(a), the demonstration shall be conducted in accordance with FAR Part 125, Appendix B and the procedure described below.

A. Type Certification Only Demonstration. If the demonstration is conducted for the purpose of complying only with FAR § 25.803 (the certification rule), or by

persons other than ASIs assigned by AFS-1, the airplane shall not be considered “previously demonstrated” for operations to be conducted under FAR Part 125. Therefore, a FAR Part 125 operator who proposes to put such an airplane into service must conduct a full-scale demonstration in accordance with FAR § 125.189(a) and FAR Part 125, Appendix B.

B. Aircraft Certification Office. Aircraft Certification Offices have primary responsibility for the planning, conduct, and evaluation of manufacturer emergency evacuation demonstrations.

11. THE ABORTED TAKEOFF DEMONSTRATION

A. Airplane Configuration. If an operator proposes to operate airplanes configured with 44 or less passenger seats, even though they may have been type certificated with more than 44 seats, an emergency evacuation demonstration is not required.

B. Requirements for Full-Scale Demonstration. After the POI or Certification Project Manager (CPM) determines that a full-scale demonstration is required, the operator must develop a plan outlining the manner in which the demonstration is to be conducted. ASIs responsible for the demonstration must meet with the operator as often as necessary to ensure that the operator clearly understands which documents and information are required for the plan to be accepted for evaluation.

C. Participants

(1) *Representative Passenger Complement.* (1) In a full-scale aborted takeoff emergency evacuation demonstration, the operator must assemble a representative passenger complement in accordance with FAR Part 125, Appendix B, (a)(7). Before conducting the demonstration, the operator must ensure that the participants meet the appropriate criteria. If participants do not meet the criteria, the operator must repeat the demonstration.

(a) Participants must be representative of a normal passenger complement as follows:

Passenger	Age	Percentage of full seating capacity
Adult Female	12-60	30% minimum
Adult Males	12-60	50% to 60%
Adult Males and Females (proportional mix).	over 60	5% minimum
Children (prorated by age).	3-11	5% to 10%
Life-sized dolls	-	3 each

(b) The “life-sized dolls” referred to above must be carried by passengers to simulate infants two years old or younger.

(c) None of the passengers may be crewmembers, mechanics, or training personnel who maintain or operate the airplane.

(d) No employee of an applicant, certificate holder, or manufacturer may be seated next to an exit.

(e) Because of child labor laws in some localities, it may not always be possible to have children between the ages of three and 11 participating in full-scale evacuation demonstrations. In these situations, a proportional mix of the overall passenger complement may be substituted.

(f) The operator may not practice, rehearse, or describe the demonstration for the passengers, nor may any participant have taken part in this type of demonstration within the preceding six months.

(2) *Company Personnel*

(a) Company officials, such as directors of operations and maintenance, must be available at the site of a demonstration. These individuals must have authority to direct modifications to the demonstration plan at the time of the demonstration. They must also be able to respond to the FAA for specific corrective actions which may be required due to deficiencies during the demonstration.

(b) Other company personnel present at the demonstration site should have a direct role in conducting the demonstration. It is the company’s responsibility to ensure that these persons do not pose a distraction or affect the demonstration’s outcome.

(3) *Use of Flight Attendants.* If the applicant/operator proposes to use flight attendants, the demonstration flight attendant complement must have the minimum number the operator proposes to use during FAR Part 125 operations. In no case shall the minimum number be less than that specified in FAR § 125.269.

(4) *The Demonstration Team.* The FAA team responsible for evaluating the emergency evacuation demonstration is headed by a team leader. Maintenance, avionics, and operations ASIs familiar with FAR Part 125 operations and applicable regulatory requirements should be assigned as needed.

(a) *Initial Certification:* For an initial certification, the Certification Project Manager also serves as the demonstration team leader.

(b) *Existing Operator:* When a demonstration is conducted by an existing operator, the Flight Standards District Office Manager will normally assign one of the operator’s Principal Inspectors or a regional expert to serve as the demonstration team leader.

(c) *Team Leader Responsibilities:* The FAA team leader is responsible for coordinating, conducting, and evaluating the emergency evacuation demonstration. The team leader also serves as the focal point and central spokesperson for the FAA on all matters pertaining to the demonstration.

(5) *Safety Personnel.* The company shall provide safety personnel at strategic locations around the aircraft to protect participants. Safety personnel shall not provide any assistance to crewmembers, such as positioning slides or assisting evacuees through exits, nor may they in any manner contribute to the efficiency of the evacuation. Safety personnel are used only to ensure passengers are not accidentally injured by slipping off wings or falling from exits.

(6) Other Personnel

(a) Non-company or non-FAA personnel must have specific reasons to observe the emergency evacuation demonstration. Usually, these individuals will be representatives of the aircraft manufacturer, manufacturers of other items of equipment used during the demonstration, or other organizations that have a direct interest in aviation safety.

(b) The operator is responsible for all non-FAA personnel who observe the demonstration. Those not directly involved in the demonstration should be kept at a reasonable distance away from the airplane by some restrictive means, such as ropes or lines.

(7) *FAA Observers.* The FAA team leader is responsible for the FAA personnel who observe the demonstration. FAA observers should be limited to those who are required to evaluate the conduct of the demonstrations or need to be involved for other specific reasons, such as:

- Members of the FAA team responsible for evaluating the demonstration
- ASIs from other offices whose operators will be acquiring the same or similar type aircraft as the one being demonstrated
- Regional or Headquarters officials or designees
- FAA personnel from the Certification Directorate, the Flight Operations Evaluation Board, the Aircraft Evaluation Group, or any other FAA office concerned with any technical or engineering aspects of the aircraft

D. *Airplane Positioning.* The airplane must be positioned in a normal ground attitude and configured for takeoff. Each passenger compartment door or curtain must be positioned as it would be for a normal takeoff.

13. MAXIMUM DEMONSTRATED SEATING CAPACITIES. Before conducting emergency evacuation demonstrations, the ASI must know the maximum number of passenger seats for specific air transport category aircraft used in FAR Part 125 operations. This information, along with data regarding interior configurations and other relevant factors, can be obtained through the following offices:

- The Seattle Aircraft Evaluation Group (ANM) for large aircraft
- The Central Aircraft Evaluation Group (ACE) for small aircraft

15. THE OPERATOR'S PLAN

A. The operator must submit an emergency evacuation or ditching demonstration plan no later than 30 working days before the demonstration is to occur. The applicant/operator's plan shall contain the following information:

(1) *Letter of Request.* Team leaders must ensure that the operator is aware that the initiation signal must be given to both cabin and FAA personnel simultaneously. Developing the procedure for this requirement is the operator's responsibility, although the FAA team leader must thoroughly review the procedure for adequacy.

(2) *Airplane Diagram*

(3) *Appropriate Portions of the Manual*

(4) *Passenger Information Card*

(5) *A Description of the Emergency Equipment Installed on the Aircraft.* The type and model of each item of equipment, as applicable, must be indicated.

(6) *List of Crewmembers.* The plan must include a list of each crewmember, both flight deck and cabin, who is or will be qualified to participate in the demonstration.

(a) The flight crew must be qualified in the aircraft to be used. However, the initial operating experience requirement need not be completed.

(b) Flight attendants designated by the FAA to participate in the demonstration shall not be provided emergency training or aircraft emergency equipment familiarization in addition to that specified in the applicant's or operator's approved training program (if any) before the demonstration.

(7) *Description of Plans to Ensure Dark of Night.* FAR Part 125, Appendix B, (a)(1), specifies that the full evacuation demonstration shall be conducted during the dark of night. Therefore, the plan must contain a description of how the operator will ensure the demonstration is conducted in the dark of the night or in conditions which simulate the dark of the night. The most effective way of controlling the level of illumination is to conduct the demonstration in a darkened hanger.

(8) *Description of Position.* The plan must include a description of how the applicant or operator plans to ensure the airplane is positioned in a location that will allow the unobstructed deployment of all emergency evacuation slides or slide rafts, as applicable.

B. *FAA Review of the Operator's Plan.* Upon submission of the proposal, the Principal Inspectors or the certification team must conduct an initial review to ensure all the required information and documents are included. It is important that the FAA respond to the operator's plan in a timely manner. Minor omissions or deficiencies can often be resolved quickly by contacting the company's evacuation demonstration project coordinator. If the applicant/operator's plan has a significant number of required items or documents missing or is obviously incomplete, the entire plan must be returned to the applicant/operator with a written explanation of why it is unacceptable. The applicant/operator must be advised that the FAA will take no further action until an acceptable plan is submitted.

(1) *Evaluating the Plan.* The team leader must ensure that the information and items in or attached to the operator's letter of request are acceptable and consistent with the proposed type of operation. During this analysis and review the demonstration team leader must ensure the following:

- The applicant/operator's emergency

procedures in the operator's manual have been FAA approved

- Evacuation procedures in the operator's manuals, including the individual crew-member assignments, are realistic, can be practically accomplished, and comply with FAR § 125.73(m)
- The passenger information card is understandable and consistent with the type and model of airplane to be demonstrated. Guidance is provided in Advisory Circular 121-24, "Passenger Safety Information Briefing and Briefing Cards."
- The emergency equipment is acceptable for the type of operation proposed

(2) *On-Site Evaluation.* Certain items in the proposal may require on-site evaluation. For example, the hangar or ramp area the applicant/operator intends to use for the demonstration should be inspected for its adequacy. The ASI should determine that the applicant/operator has, or is making, provisions for participant safety during the demonstration, including the use of safety observers, stands, padding, mats, and any other appropriate safety measures.

(3) *Resolving Deficiencies.* Deficiencies noted during this analysis and review should be resolved immediately with the company's evacuation demonstration project coordinator. If major discrepancies surface during the FAA evaluation or if the FAA and the applicant/operator are unable to resolve significant issues, the ASI shall return the operator's plan with a letter explaining why it is being returned. The operator shall be advised that the discrepancies outlined in the letter must be corrected and a plan resubmitted before the FAA takes further action. If, after a detailed evaluation, the submission is found acceptable, the operator shall be notified and the actual demonstration observed.

17. PRE-DEMONSTRATION MEETING WITH OPERATOR. After reviewing and evaluating the operator's plan, the FAA team leader should meet with the operator's project coordinator. In the meeting, the team leader should accomplish the following:

- Review the operator's plan and ensure it reflects the operator's thorough familiarity with the applicable criteria
- Ensure the operator is aware of responsibilities regarding participant safety, including provisions for safety observers, stands, ramps, padding, and ambulance coordination, as applicable
- Review the method and signals for initiating the demonstration, training methods, and timing criteria
- Determine the signal to be used to terminate the demonstration, such as an air horn or other clear and distinguishable audible signal. A suitable device should be agreed upon and tested to ensure its adequacy.

NOTE: Previous experience has shown that a whistle blast may not be adequate.

- Resolve any issues the operator may have before conducting the demonstration

19. FAA TEAM PLANNING.

A. The FAA team leader shall plan the team member assignments in the following areas:

- Timekeeping
- Position inside or outside the airplane
- Inspection of the emergency equipment, the airplane, and any applicable documents

B. The team leader should distribute to the ASIs an aircraft diagram showing their assigned locations for the demonstration.

C. The typical crewmembers selected from the list provided by the operator should not include those who

may have an above average level of competency or experience in airplane evacuation procedures. The team should avoid selecting the following types of crewmembers:

- Those used in previous demonstrations
- Emergency procedures instructors
- Supervisors
- Check airmen
- Union safety representatives

21. SELECTING EXITS. In airplanes with even number of exits, no more than 50 percent of the total number of exits and slides may be opened and deployed. When an airplane has an odd number of emergency exits, subtract one. Fifty percent of the remaining number of exits shall be opened and the associated slides (if applicable) deployed. All other exits must be blocked.

A. *Flight Attendants and Emergency Exits.* Any emergency exits assigned to flight attendants as part of their evacuation duties may be selected for use during the demonstration. These floor-level exits (doors) and non-floor-level exits (windows or plugs) may be used, provided they are designated as primary exits in the company's evacuation procedures. Ventral (stairs) and tailcone exits should not be used unless they are paired with another exit. If there is any doubt about which exits are paired, consult the Aircraft Certification Office responsible for the type certificate of the model.

B. *Blocking Exits.* The operator may propose the method of blocking and provide the logistical support, as applicable, for the proposed method. The FAA team, however, determines which exits are to be blocked. After the FAA team determines which exits shall be used, the team must exercise extreme care to ensure the operator does not obtain that information.

C. *Methods of Blocking Exits.* The following are examples of acceptable methods of blocking exits during an emergency evacuation demonstration:

- (1) Position an ASI inside the airplane at each door or

window exit before initiating the demonstration. When the evacuation is initiated, the ASI positioned in front of exits to be opened shall remove themselves from that position as quickly as possible. ASIs positioned in front of exits not to be used will block the exit by holding up their hands and stating in a distinct, clear manner, "This exit is blocked." This is considered the most effective method for blocking overwing exits.

(2) Tape a swatch of red cloth outside covering each door window and window exit. Secure to the covering a line long enough to reach the ramp or hangar floor. At the initiation signal, designated ASIs will pull the line to remove the covering from the door windows or window exits that are to be used and will leave the covering on the ones not to be used, i.e., "blocked."

(3) Outside the aircraft, rig red lights in front of the door or window exits. These red lights, when illuminated, can simulate a fire at those exits to be blocked. These lights must be illuminated simultaneously with the initiation signal.

D. Coordination with Operator. When a method of blocking the exits has been determined, the FAA team leader must notify the company's project coordinator of FAA concurrence with the method and ensure the company will provide the required maintenance and logistical support to prepare the airplane for the demonstration.

23. INITIATION SIGNAL. The operator should propose a method which provides the same initiation signal for the participants inside the airplane and the FAA team members outside the airplane. The preferred method is for a company employee to interrupt the airplane's normal source of power by disconnecting or turning off an external source of power or a ground power unit, or by disconnecting or turning off the auxiliary power unit. Either of these actions provide a clear initiation signal in two ways:

- Inside the airplane, the flight attendants observe the extinguishing of the normal cabin lighting and the illumination of the emergency lighting system as their signal to commence the evacuation demonstration

- Outside the airplane, the FAA observers stationed at each exit and the team leader, who serves as the timekeeper, observe the extinguishing of the external lights (for example, taxi lights, anti-collision lights, position lights, and logo lights). This signal initiates the timing and necessary observation actions of the FAA team.

25. PRE-DEMONSTRATION INSPECTION. Before the demonstration, the FAA team must inspect the airplane and emergency equipment. The aircraft must be configured and equipped for takeoff, in accordance with the operator's manuals and procedures, to include the full passenger seating configuration and all the appropriate emergency equipment. Stands and ramps used to descend from the wing to the ground should be inspected for structural integrity and security. Other safety equipment such as mats or inverted life rafts may be placed on the ground to protect participants. No other equipment that is not part of the airplane's emergency evacuation system may be used to aid the participants in reaching the ground. If stands and ramps are used only for the exits that will be activated, they must not be positioned against the aircraft until all passengers and crewmembers have boarded the aircraft, all exits and doors have been closed, and all passengers and cockpit windows have been blocked out. This will prevent disclosure of the available emergency exits.

27. PRE-DEMONSTRATION BRIEFINGS. Before the actual demonstration, three separate briefings should be conducted for the crewmembers involved in the demonstration, the participants, and the FAA team.

A. Crewmember Briefing. The company's emergency evacuation project coordinator should provide crewmembers with certain information regarding the demonstration. The FAA team leader must attend this briefing to resolve any questions and ensure the following items are discussed:

- The purpose of the demonstration, which is to evaluate the adequacy of the company's emergency procedures and the effectiveness and reliability of the airplane's emergency equipment
- The initiation signal

- The significance of the 90-second time limit
- The signal to be used by the FAA team leader for stopping the demonstration. Any evacuation activity in progress shall immediately cease with a “stop” signal.
- The importance of safety during the demonstration, including crewmember responsibilities and safety observer duties and limitations

B. *Participant Briefing.* Before the demonstration, participants should be provided the following information by the company’s project coordinator:

- The purpose of the demonstration is to evaluate how quickly the aircraft can be evacuated safely
- Participants are requested to pay attention to the flight attendant’s instructions
- Individual safety is not to be compromised at any time during the demonstration

29. CONDUCTING THE DEMONSTRATION. The team leader shall ensure all pre-demonstration briefings and inspections are conducted before the actual demonstration. The following sequence of events represents an acceptable means, derived from many years of experience, for conducting the demonstration.

A. *Passenger Boarding.* The team leader shall advise the operator to board the passengers as routinely as possible and prepare for departure. No passenger may be assigned a specific seat unless the FAA team determines whether the assignments are in accordance with the operator’s normal boarding procedures.

B. *Flight Attendant Preparations.* Flight attendants must prepare for a normal departure in accordance with the operator’s procedures. This includes closing and securing all exits, galleys, etc., and arming the emergency evacuation system for takeoff. They also must conduct a passenger briefing in accordance with FAR § 125.327 and

the company’s procedures. Flight attendants must sit at their assigned positions with their restraint systems fastened.

C. *Carry on Luggage.* The carry-on luggage distributed by the FAA team consists of small suitcases, gym bags, airline flight bags, briefcase, etc., that will fit under a passenger seat. They must be filled with clothes or newspaper and should be placed in the main aisles, one bag per seat row for each aisle. Approximately one-half of the total average amount of carry-on baggage, blankets, pillows, and other similar articles should be placed in the aisles and emergency exit access ways to create minor obstructions.

D. *Flight Crew Preparation*

(1) Before the initiation signal, the flight crew must accomplish all the appropriate checklists and configure the airplane for a normal takeoff. If the operator’s emergency evacuation procedures require the wing flaps or leading edge lift devices to be placed in the fully extended position, the airplane will be so configured before the demonstration and before any stands and ramps are positioned. Wing flaps and leading edge lift devices shall not be repositioned until after the demonstration.

(2) After completing all required pre-takeoff actions, the pilot in command must advise the FAA team leader, positioned forward of the nose of the aircraft, by ground interphone that the airplane is ready for takeoff.

C. *FAA Team Responsibilities*

(1) FAA observers assigned to exits that are to be used shall count the number of participants as they exit the airplane.

(2) After the termination signal, each observer shall note any continuing evacuation, which constitutes an unsatisfactory demonstration.

(3) FAA observers inside the airplane shall note any passenger or crewmember participants who remain in the airplane after the team leader’s termination signal.

(4) Team members in the cabin shall assure that all equipment works properly, e.g., floor proximity lighting, emergency exit lights, etc.

(5) The FAA team should immediately confer on the observations of each team member and the overall conduct of the demonstration before advising the operator of the demonstration results. It is important that team members do not discuss the results of their observations with company personnel or participants. It is the responsibility of the FAA team leader to brief the appropriate company management personnel on the demonstration results.

31. DITCHING DEMONSTRATIONS

A. The ditching demonstration allows the FAA to evaluate the operator's ability to prepare the passengers, airplane, and ditching equipment safely for a planned water landing. The demonstration is conducted in accordance with the requirements specified in FAR § 125.189(c), FAR Part 125, Appendix B(b), and information and guidance provided in this section. During the demonstration the following areas are evaluated:

- Emergency Training
- Ditching Procedures
- Crewmember Competency
- Equipment Reliability and Capability

B. *Ditching Demonstration Regulatory Requirements.*

FAR § 125.189(c) requires an operator planning to operate a land airplane in extended overwater flights to conduct a full-scale ditching demonstration when no other FAR Part 125 applicant or certificate holder has successfully demonstrated the proposed type and model. Partial aborted takeoff or partial ditching demonstrations are not allowed under FAR Part 125 except by deviation authority. A full-scale demonstration is conducted in accordance with the criteria in FAR Part 125 Appendix B(b), Ditching Demonstrations.

(1) *Location.* The demonstration must be conducted outside during daylight hours or in a lighted hanger if conducted at night.

(2) *Required Crewmembers.* All crew members

required by the operator's emergency ditching procedures must be present.

(3) *Participants.* Participants are used in a ditching demonstration only when required by the operator's procedures to assist in removing and launching life rafts. Passengers shall not receive any instructions before the demonstration except for those required by the operator's manual.

C. *The Ditching Demonstration Process.* Ditching demonstrations are normally conducted after the satisfactory completion of the aborted takeoff emergency evacuation demonstration.

(1) *Ditching Demonstration Combined with Aborted Takeoff Demonstration.* If the operator plans to conduct the ditching demonstration in conjunction with the emergency evacuation demonstration, the operator's demonstration plan must include information applicable to the ditching demonstration.

(2) *Ditching Demonstration Without Emergency Evacuation Demonstration.* If the operator must conduct a ditching demonstration but chooses not to conduct it with the emergency evacuation demonstration, the plan must be submitted at least 15 working days before the date of the actual demonstration.

(3) *Review of Ditching Plan.* When the ditching demonstration plan has been submitted and accepted by the FAA, the ASI must review the proposal thoroughly to ensure the following:

- The proposed demonstration meets the criteria in FAR § 125.189(c) and FAR Part 125, Appendix B(b)
- Emergency ditching procedures in the operator's manual have been accepted and must provide for safe operating practices

(4) *FAA Team Appointment.* If an aborted takeoff emergency evacuation demonstration is not conducted, the district office manager shall appoint a ditching demonstration team and a team leader.

(5) *Use of Passengers to Aid Post-Ditching Evacuation.*

If the operator's procedures require the use of passengers, the necessary passengers must be aboard the aircraft and participate in the demonstration. The operator may not practice, rehearse, or describe the demonstration to the passengers. No participant may have taken part in this type of demonstration within the preceeding six months.

(6) *Ditching Demonstration Time Limit.* The regulations do not specify a maximum time limit to complete a ditching demonstration. During an actual ditching situation, the airplane may remain afloat for a short time; therefore, it is imperative that emergency equipment, crewmember competency, and emergency procedures provide for rapid evacuation.

(a) During the demonstration, emphasis is on crewmember efficiency and ability in the time period between the decision to ditch and the actual water landing. Six minutes is considered the maximum time acceptable for ditching preparation, beginning with the ditching announcement and ending with the actual evacuation of the airplane.

(b) All participating crewmembers must have correctly donned life preservers and removed life rafts from stowage, if applicable. Crewmembers must be ready to evacuate within six minutes of the ditching announcement. Failure to do so constitutes an unsatisfactory demonstration.

(c) The FAA team leader begins timing when the captain issues the evacuation order. At the end of the six minute "planned ditching" period the crew must be prepared for a simulated water landing. After the simulated water landing, all life rafts will be removed from storage. This action is not specifically timed; however, the crewmembers must demonstrate competency in removing the rafts. Equipment must be capable of being removed for deployment in a reasonable amount of time. All life rafts and slide rafts will be launched and inflated. Crewmembers assigned to any inflated raft must enter the raft and locate and describe the use of each item of emergency equipment within the raft.

(7) *Simulating a Ditching.* Either the airplane, a life-size mockup, or a floating device which accurately simulates the passenger compartment must be used for the demonstration (FAR Part 125, Appendix B (b)(6)(i) and (ii)). The FAA prefers to use the airplane for all ditching demonstrations. If the operator proposes to use a life-size mockup or a floating device to conduct the demonstration, approval must be granted by AFS-1. The operator's request must include specific reasons why the airplane cannot be used. AFS-1 will respond in writing to the operator, granting or denying use of a life-size mockup or floating device.

(8) *Ditching Emergency Exits.* Stands must be placed at each emergency exit and wing. FAR § 25.807(d) requires that, during type certification, ditching emergency exits must be above the calculated waterline that exists when the airplane is at rest in the water. This waterline and the designated ditching emergency exits are defined in the manufacturer's ditching document, which is part of the final, FAR Part 25 type-certification report. This waterline is where the tops of the stands shall be positioned.

33. EVALUATING EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS

A. During the observance of the aborted takeoff demonstration or the ditching demonstration, the FAA team evaluates the following:

- Crewmember compliance and effectiveness in performing assigned duties and responsibilities
- The flight crew's effectiveness in exercising command responsibilities and the coordination and communication between the flight crew and flight attendants
- Any shortcomings, deficiencies, or delays caused by the emergency equipment
- Adherence to applicable time limits (90 seconds for emergency evacuation and six minutes for ditching)
- Proper opening of all designated exits and

slides. Designated exits and slides must be ready for use. If applicable, all passengers and crewmembers must properly evacuate within the appropriate time limit.

- Efficient removal of life rafts from storage
- Proper inflation of all designated life rafts or slide rafts
- The capability of each item of emergency equipment to perform its intended function

B. *Unsatisfactory Demonstrations.* Failure to meet the specified time limit is automatic grounds for an unsatisfactory demonstration.

(1) Depending on the severity of the deficiency, deficiencies in other areas (i.e., crewmember ineffectiveness, equipment malfunctions, etc.) that occur even when the time limits are met may be grounds for an unsatisfactory demonstration.

(2) If the cause of a relatively severe deficiency was improper company training, procedures, or maintenance, the demonstration should be judged unsatisfactory. For example, if all the emergency lighting failed to illuminate because of a maintenance problem, there are sufficient grounds for determining the demonstration to be unsatisfactory.

(3) Minor deficiencies can usually be resolved with responsible company personnel without having to declare the demonstration unsatisfactory.

C. *Satisfactory Demonstrations.* When the operator meets the specified time limits and any minor discrepancies are resolved, the demonstration is considered satisfactory.

D. *Reporting Requirements.* The team leader is responsible for the preparation and distribution of the emergency evacuation or ditching demonstration report. The report shall include at least the following:

- FAA Form 8430-1, Emergency Evacuation Demonstration Report. A form is required for each demonstration attempt. For example, if two demonstrations are unsuccessful and a third is satisfactory, three forms shall be completed and submitted as part of the demonstration report package.
- The passenger information briefing card required by FAR § 125.327(c)
- A diagram of the aircraft, including emergency equipment, exits, exits used, the number of approved passenger seats, and the location of seats used by flight attendants
- The name and specialty of each member of the FAA team

Section 2 Procedures

1. PREREQUISITES AND COORDINATION REQUIREMENTS

A. *Prerequisites*

- Knowledge of the regulatory requirements of FAR Part 125
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

B. *Coordination.* This task requires coordination with the Principal Operations Inspector and the regional office.

3. REFERENCES, FORMS, AND JOB AIDS

A. *References*

- FAR §§ 25.803(c) and 121.291
- Advisory Circular 121-24, Passenger Safety Information Briefing and Briefing Cards, as amended

B. Forms

- FAA Form 8430-1 (Revised), Emergency Evacuation Demonstration Report

C. Job Aids. None.**5. PROCEDURES***A. Determine the Need for an Emergency Evacuation Ditching Demonstration*

(1) If any of the following conditions apply, a demonstration is required:

- Initial introduction of a type and model airplane for carrying passengers, if more than 44 seats are installed
- Passenger seating capacity is increased by more than 5 percent over that previously demonstrated
- A major change is made in the cabin configuration, affecting the emergency evacuation of passengers
- An operator plans to use a land airplane in extended overwater operations

(2) If a demonstration is required, advise the operator or applicant in writing that an demonstration plan is required.

B. Ensure that Emergency Evacuation/Ditching Procedures are Included in the Company Manual

C. Review Operator's Plan. Determine if the plan submitted by the operator is satisfactory or unsatisfactory.

(1) If the operator must conduct a ditching demonstration and intends to do so with the aborted takeoff demonstration, the plan must include the following:

- (a) Copies of the operator's manual relating to crewmember ditching duties and responsibilities

(b) A description of the applicable emergency equipment used for the ditching demonstration (life rafts, survival gear, etc.), including type and model

(c) The airplane type and model or a description of the mockup or floating device (simulating a passenger compartment) that will be used

(d) The proposed date, time, and location of the ditching demonstration

(e) The name and telephone number of the company's ditching demonstration project coordinator

(f) A list of all crewmembers who will participate in the demonstration

(2) The plan must also include a representative diagram of the aircraft with the following information:

- (a) Location and designation of each exit
- (b) Locations of emergency ditching equipment, including:
 - Life rafts/slide rafts
 - Survival radios
 - Pyrotechnic signaling devices
 - Passenger/crewmember life preservers or individual flotation devices

(3) If the plan is unsatisfactory, return the plan to the operator with a letter indicating the reasons the plan is not acceptable. Advise the operator in the letter that a revised plan must be received within 30 days of the date on the letter.

(4) When a plan is finally satisfactory, send a copy to the regional office.

D. Assemble FAA Team Members. Once an evaluation team has been assembled, a team leader will be designated. The team leader will accomplish the following:

(1) Provide specific team member assignments for the demonstration

(2) Distribute an airplane diagram to all team members showing their assigned locations for the demonstration

(3) Determine which emergency exits must be opened and the manner in which other exits must be blocked

(4) Select typical crewmembers to be used in the demonstration from the list provided by the operator

(5) Determine a signal to be used to initiate the demonstration

(6) Determine the signal to be used to terminate the demonstration

(7) Review the regulatory criteria

(8) Assign report writing requirements to members of the team

E. Perform Pre-Demonstration Airplane and Emergency Equipment Inspection. If the inspection is unsatisfactory, determine if the problem can be corrected immediately.

(1) If the problem can be corrected immediately, indicate satisfactory on the job aid and proceed with the pre-demonstration FAA team briefing.

(2) If the problem cannot be corrected immediately, reschedule the inspection and subsequent demonstration.

F. Conduct Pre-Demonstration Briefing of FAA Team Members. The team leader must brief FAA personnel on the following items:

- The objectives of the demonstration
- The initiation signal

- Assignments with regard to exits to be used or blocked
- The signal that stops the demonstration
- The importance of not discussing the results of their observations with anyone other than the team leader

G. Evaluate Operator's Pre-demonstration Crewmember Briefing. Ensure that the operator's demonstration project coordinator includes the following items in the crewmember briefing:

- The purpose of the demonstration
- The initiation signal
- The significance of the time limits for full-scale evacuations, partial evacuations, or ditching, as applicable
- The signal to be used by the FAA team leader for stopping the demonstration. Any evacuation or ditching activity in progress must cease immediately with a stop signal.
- The importance of safety during the demonstration, including crewmember responsibilities and safety observer duties and limitations

(1) If the briefing was satisfactory, proceed with the emergency evacuation demonstration or ditching demonstration, as applicable.

(2) If the briefing was not satisfactory, inform the demonstration project coordinator of the deficiencies. Have the crewmembers briefed again. When the briefing is satisfactory, proceed with the emergency evacuation demonstration or ditching demonstration, as applicable.

H. Conduct Emergency Evacuation Demonstration

(1) Tell the demonstration project coordinator to move the participants into position.

(2) Ensure that the flight attendants accomplish the following:

- Prepare for a normal departure in accordance with the applicant/operator's procedures
- Conduct a passenger briefing in accordance with FAR § 125.327 and the company procedures
- Sit at their assigned positions with their restraint systems fastened

(3) Distribute carry-on baggage, blankets, pillows, and items of clothing in the aisles and emergency exit access ways to create minor obstructions.

(4) Ensure each external door and exit and each internal door or curtain is in position for a normal takeoff.

(5) Ensure that the flight crew accomplishes the following:

- Completes all the appropriate checklists
- Configures the airplane for a normal takeoff
- Sits in normal positions with restraint systems fastened

(6) When advised that the crew is ready, ensure that all FAA team members and any company safety observers are ready and in position.

(7) Issue a warning signal, which must precede the initiation signal by 30 seconds. Then, issue the initiation signal.

(8) The team leader begins timing with at least two stopwatches (a primary and a backup) when the external airplane lights are extinguished.

(9) Issue a clearly audible signal terminating the demonstration at the end of the applicable time period.

I. Conduct a Ditching Demonstration

(1) In addition to the procedures for an emergency evacuation above, the ditching demonstration must be conducted in the following manner:

(a) Before the ditching demonstration, inspect each item of emergency ditching equipment for compliance with appropriate airworthiness and other applicable directives

(b) The FAA team leader must ensure all ASIs and crewmembers are at their assigned positions. The team leader will then advise the captain to commence the demonstration.

(c) The pilot-in-command will initiate the demonstration by ordering the crewmembers to prepare for ditching

(2) The team leader will begin timing with at least two stopwatches (a primary and a backup) when the pilot-in-command announces to prepare for ditching.

(3) Observe crewmembers preparation activities.

(4) At the end of six minutes, advise the pilot-in-command to announce that the airplane is in the water.

(a) When the ditching signal is received, each evacuee (crewmembers and participants, if applicable) must don a life preserver according to the operator's procedures and the flight attendant's briefing.

(b) Each life raft or slide raft must be launched and inflated according to the operator's procedures. All required emergency equipment must be placed in the rafts.

(c) Each evacuee must enter a life raft or slide raft. The crewmembers assigned to the raft must locate and describe the use of each item of emergency equipment.

(5) Observe the deployment of the rafts.

(6) Observe crewmembers' ability to use the emergency equipment.

J. Evaluate Emergency Evacuation or Ditching Demonstration. Immediately confer with the FAA team on the

observations of each team member and the overall conduct of the demonstration. If any item on any team member's Evaluation Job Aid is marked in the "NO" column, then judge the entire demonstration unsatisfactory.

K. *Advise Operator of Results.* When the team reaches agreement on the demonstration results, the team leader will advise the operator.

(1) If the results are unsatisfactory, issue a letter of disapproval to the operator. The demonstration process must begin again.

(2) If the results are satisfactory, issue a letter of approval to the operator. Add the airplane to the operator's operations specifications.

L. *Complete Emergency Evacuation Demonstration Report, FAA FORM 8430-1 Revised.* Complete the form only through item 22. Have the Flight Standards District Office Manager sign the original. Forward one copy to the Regional Office. Provide the operator with a copy. Place the original in the district office file on the operator.

7. TASK OUTCOMES

A. *File PTRS Transmittal Form.*

B. Completion of this task will result in one of the following:

(1) Completion of FAA Form 8430-1, indicating the emergency evacuation or ditching demonstration was satisfactory.

(2) Completion of FAA Form 8430-1, indicating the emergency evacuation or ditching demonstration was unsatisfactory.

C. *Document Task.* File all supporting paperwork in the operator's office file.

9. FUTURE ACTIVITIES. The record of any emergency evacuation or ditching demonstration will be reviewed in future surveillance.